

**Commonwealth of Kentucky**  
**Division for Air Quality**

**PERMIT APPLICATION SUMMARY FORM**

Completed by: Herbert Campbell

GENERAL INFORMATION:

Name:	University of Kentucky
Address:	Room 215, Peterson Service Building Lexington, KY 40506
Date application received:	3/27/2008
SIC Code/SIC description:	8221, Colleges, Universities, and Professional Schools
Source ID:	21-067-00003
Agency Interest:	1104
Activity:	APE20080001
Permit:	V-08-014

APPLICATION TYPE/PERMIT ACTIVITY:

<input type="checkbox"/> Initial issuance	<input type="checkbox"/> General permit
<input type="checkbox"/> Permit modification	<input type="checkbox"/> Conditional major
__Administrative	<input checked="" type="checkbox"/> Title V
__Minor	<input checked="" type="checkbox"/> Synthetic minor
__Significant	<input type="checkbox"/> Operating
<input checked="" type="checkbox"/> Permit renewal	<input checked="" type="checkbox"/> Construction/operating

COMPLIANCE SUMMARY:

<input type="checkbox"/> Source is out of compliance	<input type="checkbox"/> Compliance schedule included
<input type="checkbox"/> Compliance certification signed	

APPLICABLE REQUIREMENTS LIST:

<input checked="" type="checkbox"/> NSR	<input checked="" type="checkbox"/> NSPS	<input checked="" type="checkbox"/> SIP
<input type="checkbox"/> PSD	<input type="checkbox"/> NESHAPS	<input type="checkbox"/> Other
<input type="checkbox"/> Netted out of PSD/NSR	<input checked="" type="checkbox"/> Not major modification per 401 KAR 51:001, 1(116)(b)	

MISCELLANEOUS:

- ☐ Acid rain source
- ☐ Source subject to 112(r)
- ☒ Source applied for federally enforceable emissions cap
- ☐ Source provided terms for alternative operating scenarios
- ☐ Source subject to a MACT standard
- ☐ Source requested case-by-case 112(g) or (j) determination
- ☐ Application proposes new control technology
- ☒ Certified by responsible official
- ☐ Diagrams or drawings included
- ☐ Confidential business information (CBI) submitted in application
- ☐ Pollution Prevention Measures
- ☐ Area is non-attainment (list pollutants):

EMISSIONS SUMMARY:

Pollutant	Actual (tpy) <sup>1</sup>	Potential (tpy)
PM/PM <sub>10</sub>	22.3/15.7	176.2/76.4
SO <sub>2</sub>	648.8	2175.0
NO <sub>x</sub>	273.1	873.0
CO	119.7	462.7
VOC	2.6	27.4
LEAD	0.02	0.4
HCl	6.9	7.8 <sup>2</sup>
Source wide HAPs	11.8	22.5 <sup>2</sup>

<sup>1</sup> Actual based on 2005 Emissions Survey

<sup>2</sup> Limited by Source-wide Emissions Cap to preclude CAA, Section 112 (j)

**SOURCE DESCRIPTION:**

On March 27, 2008, the University of Kentucky applied to the Division for the renewal permit of their existing permit [V-03-023 R2] in Lexington, Kentucky. The University of Kentucky (UK) is a public education institution that has a Title V operating permit, V-03-023 Revision 2, covering its main campus in Lexington Kentucky. UK is permitted to operate 23 indirect heat exchangers larger than 1.0 MMBtu/hr, 66 indirect heat exchangers 1.0 MMBtu/hr or less, 81 backup diesel generators, 2 paint booths and additional insignificant activities. The plant is classified as a Title V, Synthetic Minor source due to its having potential emissions of regulated air pollutants nitrogen oxides (NO<sub>x</sub>), sulfur dioxide (SO<sub>2</sub>) and carbon monoxide (CO), greater than a major source threshold. This permit contains practically enforceable limit to preclude the applicability of Prevention of Significant Deterioration of Air (PSD), 401 KAR 51:017. The permittee is requesting limited paint usage for the paint booths located in the Reynolds Building, Transportation Research Center and the Medical Center (formerly EUI 49 & 50) to less than 200 gallons per year. Additionally, these units are now classified as insignificant units due to the limitation, and the potential emissions of any regulated air pollutant from each unit shall not exceed five tons per year.

In Revision 2, the five diesel fired emergency generators, emission units (EU) 60, 61, 62, 67, and 68 were permitted as 2885 horsepower, with 500 hours per year operation. However, upon site inspection, the Division for Air Quality (DAQ) noted that EU 60, 61 and 62, which have been operational since March 2007, were purchased at 3286 horsepower, while EU 67 and 68 have not been installed yet. The permittee resubmitted a revised application on July 9, 2008 for the upgraded emergency generators, with calculation based on AP-42 emission factors reducing the hours and limited the hours of 500 for the five units. The source has also decommissioned a 1004 HP (746 KW) diesel generator which was one of emission unit 54 (eight generators). This has been replaced by a smaller generator at a capacity of 755HP or 450 KW (4.3 MMBtu/hr), and will be identified as emission unit 69. The calculation using emission factors from AP-42 and reduced hours per year for all five units shows that the emissions are lower than the previously submitted calculation. Also the emissions are below significant emission rate (SER) and Prevention of Significant Determination

(PSD) thresholds [401 KAR 51:001]. The applicable regulation for EU's 60, 61, 62, 67, 68 and 69 will be the same as that from the last permitting action. All 502(b)10/off permit changes have also been incorporated into this renewal permit.

### **EMISSION AND OPERATING CAPS DESCRIPTION:**

To preclude the applicability of 401 KAR 51:017, nitrogen oxide emissions from emission units 51, 52, and 53 shall not exceed 30 tons in any consecutive twelve months. NO<sub>x</sub> emissions from these units shall be calculated using the following equation:

NO<sub>x</sub> emissions (tons) = [AP-42 emission factor (lbs/1000 gallons fuel burned or lbs/10<sup>6</sup> standard cubic feet (scf or feet<sup>3</sup>) natural gas burned] x (1000 gallons or 10<sup>6</sup>scf) fuel burned per month / 2000 lbs/ton. To demonstrate compliance with this emission limitation, the total twelve-month rolling NO<sub>x</sub> emissions from emission units 51, 52, and 53 shall be calculated monthly and reported semi-annually.

To preclude the applicability of 401 KAR 51:017, sulfur dioxide emissions from emission units 51, 52, and 53 shall not exceed 26 tons in any consecutive twelve months. SO<sub>2</sub> emissions from these units shall be calculated using the following equation:

SO<sub>2</sub> emissions (tons) = [AP-42 emission factor (lbs/1000 gallons fuel burned or lbs/10<sup>6</sup>scf natural gas burned] x (1000 gallons or 10<sup>6</sup>scf) fuel burned per month / 2000 lbs/ton. To demonstrate compliance with this emission limitation, the total twelve-month rolling SO<sub>2</sub> emissions from emission units 51, 52, and 53 shall be calculated monthly and reported semi-annually.

To preclude the applicability of 401 KAR 51:017, carbon monoxide emissions from emission units 51, 52, and 53 shall not exceed 32 tons in any consecutive twelve months. CO emissions from emission units 51, 52, and 53 shall be calculated using the following equation:

CO emissions (tons) = [AP-42 emission factor (lbs/1000 gallons fuel burned or lbs/10<sup>6</sup>scf natural gas burned] x (1000 gallons or 10<sup>6</sup>scf) fuel burned per month / 2000 lbs/ton. To demonstrate compliance with this emission limitation, the total twelve-month rolling CO emissions from emission units 51, 52, and 53 shall be calculated monthly and reported semi-annually.

To preclude the applicability of 401 KAR 51:017, combined nitrogen oxide emissions from emission units 15, 16, 60, 61, 62, 63, 64, 65, 66, 67, 68 and 69 shall not exceed 36 tons in any consecutive twelve months. NO<sub>x</sub> emissions from these units shall be calculated using the following equation:

NO<sub>x</sub> emissions (tons) = [(AP-42 emission factor or vendor certified emission factor)(lbs/1000 gallons fuel burned or lbs/10<sup>6</sup>scf natural gas burned] x (1000 gallons or 10<sup>6</sup>scf) fuel burned per month / 2000 lbs/ton.

To demonstrate compliance with this nitrogen oxide emission limitation, the total twelve-month rolling NO<sub>x</sub> emissions from emission units 15, 16, 60, 61, 62, 63, 64, 65, 66, 67, 68 and 69 shall be calculated monthly and reported semi-annually.

To preclude the applicability of 401 KAR 51:017, combined sulfur dioxide emissions from emission units 15, 16, 60, 61, 62, 63, 64, 65, 66, 67, and 68 shall not exceed 36 tons in any consecutive twelve months. SO<sub>2</sub> emissions from these units shall be calculated using the following equation:

SO<sub>2</sub> emissions (tons) = [AP-42 emission factor (lbs/1000 gallons fuel burned or lbs/10<sup>6</sup>scf natural gas burned) x (1000 gallons or 10<sup>6</sup>scf) fuel burned per month / 2000 lbs/ton. To demonstrate compliance with this emission limitation, the total twelve-month rolling SO<sub>2</sub> emissions from emission units 15, 16, 60, 61, 62, 63, 64, 65, 66, 67, 68 and 69 shall be calculated monthly and reported semi-annually.

To preclude 401 KAR 51:017, carbon monoxide emissions from emission units 15, 16, 60, 61, 62, 63, 64, 65, 66, 67, 68 and 69 shall not exceed 90 tons in any consecutive twelve months. CO emissions from emission these units shall be calculated using the following equation:

CO emissions (tons) = [AP-42 emission factor (lbs/1000 gallons fuel burned or lbs/10<sup>6</sup>scf natural gas burned) x (1000 gallons or 10<sup>6</sup>scf) fuel burned per month / 2000 lbs/ton. To demonstrate compliance with this emission limitation, the total twelve-month rolling CO emissions from emission units 15, 16, 60, 61, 62, 63, 64, 65, 66, 67, 68 and 69 shall be calculated monthly and reported semi-annually.

To preclude the applicability of 401 KAR 51:017, total combined annual operating hours (12 month rolling total) for emission units 60, 61, 62, 63, 64, 65, 66, 67, 68 and 69, shall not exceed 1800 hours. To demonstrate compliance with this operating limitation, the permittee shall calculate the total twelve-month rolling hours of operation of on a monthly basis.

To preclude Section 112(j) of the Clean Air Act, source-wide emissions of Hydrogen Chloride (Single Hazardous Air Pollutant (HAP)) shall not exceed 9.0 tons in any consecutive twelve months period. HCl emissions shall be calculated using the following equation:

HCl, Single HAP Emissions (tons) = (Total tons coal burned) x (0.33 lb/ton)\* / (2000 lb/ton), \* Emission factor determined through stack testing. To demonstrate compliance with this emission limitation, the total twelve-month rolling HCl emissions shall be calculated monthly and reported semi-annually.

To preclude Section 112(j) of the Clean Air Act, the permittee shall notify the Division at least sixty (60) days prior to any change in coal supplier, fuel type, or fuel mixture, used in EU 07, 08, and 13, from those fuels used in the stack tests to establish the HCl emission factor used above for determining compliance. This notification shall include a fuel analysis of the new fuel for Hydrogen Chloride. The Division may request additional stack testing be completed in addition to this fuel analysis.

To Preclude Section 112(j) of the Clean Air Act, source-wide emissions of total Hazardous Air Pollutants (HAPs) shall not exceed 22.5 tons in any consecutive twelve months period.

To demonstrate compliance with this emission limitation, the total twelve-month rolling Total HAPs Emissions shall be calculated monthly and reported semi-annually to the Regional Office.